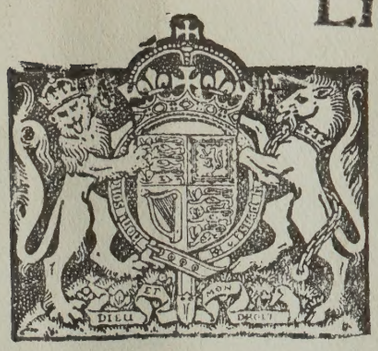

REPORT

ON THE WORKING OF THE

HARCOURT BUTLER INSTITUTE OF PUBLIC HEALTH, RANGOON

FOR THE YEAR 1939

RANGOON
SUPDT., GOVT. PRINTING AND STATIONERY, BURMA
1941

Price,—As. 4 = 5d.]

REPORT

ON THE WORKING OF THE

HARCOURT BUTLER INSTITUTE OF PUBLIC HEALTH, RANGOON

FOR THE YEAR 1939

RANGOON
SUPDT., GOVT. PRINTING AND STATIONERY, BURMA
1941

LIST OF AGENTS FOR THE SALE OF GOVERNMENT PUBLICATIONS.

In Burma

American Baptist Mission Press, Rangoon.

British Burma Press Branch, Rangoon.

Burma Book Club, Ltd., Post Box No. 1068, Rangoon.

City Book Club, No. 98 Phayre Street, Rangoon.

Continental Trading Co., No. 363 Lower Main Road, Moulmein.

Maung Lu Gale, Law Book Depôt, No. 42 Ayo-o-gale Mandalay.

Messrs. K. Bin Hoon & Sons, Nyaunglebin.

New Light of Burma Press, No. 61 Sule Pagoda Road, Rangoon.

Proprietor, Thu Dhama Wadi Press, No 16—80 Maung Khine Street, Rangoon.

Rangoon Times Press, Rangoon.

In India.

Book Co., Ltd., No. 4/4A College Square, Calcutta.

Butterworth & Co. (India), Ltd., Phonix Building, Graham Road, Ballard Estate, Bombay.

City Book Co., Post Box No. 283, Madras.

D. B. Taraporevala, Sons & Co., Bombay.

Higginbotham & Co., Madras.

Mr. Ram Narain Lal, Proprietor, National Press, Katra, Allahabad.

S. K. Lahiri & Co., No. 56 College Street, Calcutta.

Thacker, Spink & Co. (1933), Ltd., No. 3. Esplanade East, Calcutta.

Thacker & Co., Ltd., Bombay.

W. Newman & Co., Calcutta.

In Europe and America.

The publications are obtainable either direct from The High Commissioner for India, Public Department, India House, Aldwych, London, W.C. 2 or through any bookseller.

RESOLUTION

ON THE

Report on the Working of the Harcourt Butler Institute of Public Health, Rangoon

For the Year 1939.

Extract from the Proceedings of the Government of Burma, Department of Health and Public Works,—No. 361SJ40, dated the 6th July 1940.

READ—

The Report on the Working of the Harcourt Butler Institute of Public Health, Rangoon, for the year 1939.

RESOLVED THAT—

The Report be published.

By order,

SHWE BAW,
Secretary to the Govt. of Burma
Dept. of Health and Public Works,

REPORT

ON THE WORKING OF THE

Harcourt Butler Institute of Public Health, Rangoon

For the Year 1939.

STAFF OF THE INSTITUTE—*Director.*—Mr. K. P. Kundu, M.B. (Cal.), D. Bact. (Lond.).

Assistant Director.—Post held in abeyance.

Malariologist.—U Tin, D.T.M., from 1st January to 17th April ; 18th August to 11th September ; and from 1st October to 31st December 1939.

Mr. Robert K. Singh, M.B., B.S., from 18th April to 17th August 1939.

Public Analyst.—Post held in abeyance.

Assistant Chemist.—Mr. G. C. Moitra, B.Sc., F.C.S., from 1st January to 7th May, and from 9th July to 31st December 1939.

Mr. A. K. Sen-Gupta, M.Sc., F.I.C.S., from 8th May to 8th July 1939.

Second Assistant Chemist.—Mr. A. K. Sen-Gupta, M.Sc., F.I.C.S. from 1st January to 7th May, and from 9th July to 31st December 1939.

Assistant Malariologist.—Mr. Robert K. Singh, M.B., B.S., from 1st January to 17th April, and from 18th August to 31st December 1939.

Assistant Bacteriologists.—Sub-Assistant Surgeon U Pa How and Sub-Assistant Surgeon U Kaung Mra Thoo.

VISITORS.—The following persons visited the Institute during the year :—

Lieut.-Col. G. Covell, M.D., I.M.S., Director, Malaria Institute of India, Kasauli.

Dr. J. Reenstierna, M.D., Professor at the University of Upsala and Inspector of Leprosy in Sweden.

Dr. R. C. Robertson, M.C., M.D. (Glas.), M.R.C.P. (Edin.), D.P.H. (Edin.), F.R.F.P. & S. (Glas.), Member of the League of Nations Epidemic Commission to China, and Director of Lister Institute, Shanghai.

ACTIVITIES OF THE INSTITUTE.—The activities of this Institute are divided into (1) Teaching, (2) Routine Public Health Laboratory Work, (3) Investigation and Research, and (4) Public Health Propaganda.

I. INSTRUCTIONS.—The following courses of instructions were given during the year :—

(1) The Government of Burma Qualifying Course for Public Health Inspectors.

(2) The Government of Burma Licence in Hygiene Course for Sub-Assistant Surgeons.

(3) The Course of Training of Health Visitors.

Lectures and demonstrations on Hygiene and Public Health were given to the students of the following Institutions :—

(1) Medical College of the Rangoon University, and

(2) Burma Government Medical School.

A short course of instruction on Hygiene and Public Health was given to the Post-Graduate Sub-Assistant Surgeons of the Medical Department from the 5th July to 4th August 1939.

A special training in anti-malaria measures was given in the month of August to the Assistant Medical Officer of the Mawchi Mines.

A course of training in Bacteriology lasting for two months from 1st June to 31st July 1939, was given to Mr. S. Suvi, M.B., Ch.B. (Leeds), D.P.H. (Leeds), officiating Assistant District Health Officer, preparatory to his being appointed as Director of the Vaccine Depôt at Meiktila.

EXAMINATIONS.—The following examinations were held during the year at this Institute :—

(1) Efficiency bar examination of U Ba Yin, Public Health Inspector, Insein District.

(2) Efficiency bar examination of U Ba Tin (1), Public Health Inspector, Prome District.

(3) Examination of Health Visitors.

(4) Examination of Post-Graduate Sub-Assistant Surgeons of the Medical Department on Hygiene and Public Health.

(5) Examination of the students of the Burma Government Medical School on Hygiene and Public Health.

(6) Examination of the students of the Medical College of the Rangoon University on Hygiene and Public Health.

(7) Qualifying Examination for Government Licence in Hygiene.

(8) Government of Burma Qualifying Examination for Public Health Inspectors.

CINEMA SHOWS.—On seven occasions during the year, cinema shows and demonstrations were given at this Institute.

MEETINGS.—During the year under report, 33 meetings were held at the Institute by various Societies and Committees such as the Burma Red Cross Society, the National Council of Women in Burma, St. John Ambulance Association, the Burma Tuberculosis and Leprosy Relief Association, etc. The Annual General Meeting of the Red Cross Society was presided over by His Excellency the Governor of Burma.

ISSUE OF PROPHYLACTIC VACCINES.—The following table shows the issue of prophylactic vaccines during the year :—

Name of prophylactic vaccine.	Number of requisitions complied with.	Quantity issued.
Plague vaccine	290	178,170 doses.
Cholera vaccine	276	265,414 c.cs.
Influenza vaccine ...	3	60 c.cs.

II. LABORATORY ROUTINE.—*Bacteriological Laboratory.*—

(i) *Preparation of Cholera Vaccine.*—The technique employed was the same as in previous year. The stock of bulk vaccine at the beginning of the year was 201,375 c.cs. and 210,125 c.cs. were prepared during the year. A total of 235,965 c.cs. was filled in ampoules and issued to the store-keeper.

(ii) *Bacteriological analysis of water.*—Three hundred and thirty samples of water were received for routine bacteriological examination. The table below shows the number examined during the year :—

Hlawga Lakes (Corporation of Rangoon)	101
Tube Wells under the Burma Underground Water Act, 1930	68
Samples sent by the Superintendents of Jails	33
Samples sent by Municipalities	49
Samples sent by the Public Works Department	16
Samples sent by the Civil and Military Police	8
Samples sent by the Port Health Officer, Rangoon ...	4
Others	51
Total ...	330

(iii) Examination of shaving brushes sent by ths Appraiser of the Customs Department for the presence of *B. anthracis* 9

(iv) Examination of sputum for T.B. 15

(v) Chemical and cultural examination of urine ... 4

(vi) Examination of fæces for the presence of ova, protozoa, etc. 15

(vii) Examination of smears 12

(viii) *Preparation of Bacterial Emulsions and High Titre sera.*—Bacterial Emulsions of the typhoid and paratyphoid group of organisms were prepared in accordance with the instructions detailed in the Medical Council Research Series No. 51. Agglutination cholera serum, " Inaba ' O ' " was also prepared during the year.

(ix) *Identification of rats.*—The following table shows the number of rats received from the Port Health Officer, Rangoon, and identified during the year. In no case *Pr. pestis* was detected :—

Species.	Live and dead rats (Port area).	Live rats (Steamships).	Dead rats (Steamships).
G. bengalensis	1,050	*Nil.*	*Nil.*
R. norvegicus	197	17	6
R. rattus	161	48	18
M. concolor	559	1	*Nil.*
M. musculus	462	79	13
C. coerulea	252	*Nil.*	*Nil.*
Total ...	2,681	145	37

In addition to the above, three rats were received from other sources.

(x) *Identification of snakes.*—Out of twenty-one snakes received for identification, twenty belonged to the following species :—

(1) Lycodon aulicus.
(2) Psamodynastes pulverulentus.
(3) Trimeresurus gramineus.
(4) Boiga cyanodon.
(5) Chrysopelea ornata.
(6) Bungarus multicinctus.
(7) Natrix piscatus.
(8) Oligodon purpurascens.

The snake that could not be identified was received from Gyobyu, Taikkyi Township. It was sent through Professor F. J. Meggitt of Biological Department of the University of Rangoon, to Dr. Smith of the British Museum, who thought that it belonged to the genus Lycodon, but could not identify the species. His reply was as follows :— " It may be an aberrent specimen having a general reduction in scales all round, but for the present should be described as new ".

(xi) *Miscellaneous.*—(*a*) A report on the Rat Flea Survey of the Rangoon Port Area was drawn up and printed as a Government publication during the year under review.

(*b*) A poster on rat fleas depicting both sexes of Xenopsylla, Pulex, Ctenocephalus and Nosopsylla was drawn up during the year.

MALARIA BUREAU.—The following routine work was done during the year :—

(i) *Identification of specimens.*—

Anopheline larvæ	1,825
Adult anopheline mosquitoes	258

(ii) *Dissection of adult anophelines.*—A total of 47 adult mosquitoes received from Gyobyu Water Work Constructions, and from Messrs. the Indo-Burma Petroleum Co., Ltd., Indaw and Thayetmyo, were dissected.

(iii) *Blood Examinations.*—Twenty-seven blood smears were examined for the presence of malarial parasites. Nine smears were found to be positive.

(iv) *Spleen Census.*—The reports were received from 32 districts, 43 towns and 521 villages.

(v) *Fish Breeding.*—The total number of young fish born during the year was 39,521. One hundred and ninety-nine female adults and 912 male adults were distributed to subsidiary hatcheries in various districts.

(vi *Quinine Distribution.*—Prophylaxis against malaria was carried out by free distribution of quinine.

(vii) *Weekly Reports.*—Weekly reports of anti-malaria work carried out in Kyaukpyu, Maymyo and Lashio were received at the Malaria Bureau as usual.

Kyaukpyu.—Anti-malaria measures have been carried out systematically under the supervision of an Epidemic Sub-Assistant Surgeon. Reclamation of Ngalapwe swamp and of the low-lying paddy fields in Kalabadaung area have done much towards the reduction of mosquito breeding. The number of prisoners employed for the work was increased from 40 to 50. Oiling and Paris-green spraying was carried out in places where permanent measures could not be undertaken. Oil balls and oil drips were placed at important drains.

A spleen census of the town showed a spleen index of 4·25, a slight increase as compared with the figure of the previous year (2·53 per cent). This is due to an influx of malarious cases from An and Cheduba Townships. The spleen index of Ngalapwe which was 18·75 in 1938 shows a decrease to 11·36 per cent,—an example of the effect of carrying out of systematic anti-malaria measures.

Maymyo.—It is gratifying to note the interest evinced by the Anti-Malaria Committee in the carrying out of the anti-malaria measures systematically. The measures taken, *viz.*, filling up of low-lying areas, oiling, spraying of Paris-green, construction of sub-soil drainage, have been found to be effective. The Malariologist who inspected the town

in December emphasized again the necessity for the extension of the sub-soil drainage scheme, and of the adoption of such naturalistic measures as herbage cover, etc. The hatchery has been working satisfactorily and the introduction of larvivorous fish into water collections where carrier anophelines were found breeding, showed remarkable success. The campaign against domestic mosquitoes was also carried out during the year, and resulted in a considerable reduction of their number.

Lashio.—The suggestions made by the Malariologist during his last visit will, it is hoped, gradually be taken up. They should go a long way towards eradication of carrier anopheline mosquitoes, and thus improve the health of the town. A masonry hatchery built in Lashio has, during the year, been stocked with larvivorous fish, and fish-breeding as one of the anti-malaria measures is now in progress.

(viii) *Surveys and Inspections.*—Malaria surveys were carried out during the year at the following places :—

(1) Yamèthin Township.
(2) Shwedaung Town.
(3) 1st and 2nd Battalion, Burma Military Police, Rangoon.
(4) Kawlin Town.
(5) Mogôk Town.
(6) Popa Village (Myingyan Township).
(7) Kani Township.

Mosquito surveys were carried out during the year at the Mingaladon Aerodrome and Maubin Town.

Inspection of the following areas was carried out :—

(1) Kyaukpyu Town.
(2) Pyindaye Forest Reserve Area (Pyapôn District).
(3) Katha Town.
(4) Bhamo Town.
(5) Maymyo Town.

Chemical Laboratory.—A total of 989 samples comprising of 371 samples of water and 618 samples of miscellaneous foods and drugs and other articles were examined during the year under report.

Water.—Of the 371 samples of water, 104 samples from old and new tube wells were examined for the issue of permanent licences under the Burma Underground Water Act, 1930. The remaining 267 samples were received from the Public Health Department, District Councils, Municipalities, Town Committees, Hospitals, Jails and various other sources.

Foods and Drugs.—Most of the samples were received from the Port Health Department and Jails. A detailed statement showing the 618 samples of foods and drugs as well as other articles examined, is appended to this report.

Ghee.—Of the ten samples found adulterated or otherwise unsatisfactory, four were found to be entirely vegetable fat, one grossly adulterated, and the remaining five being slightly adulterated.

Milk (fresh).—Sixty-one samples, out of a total of 72 samples examined, were found to be adulterated or otherwise unsatisfactory. Water was the main adulterant in every case and some were adulterated with cane sugar, starch and lactose in addition.

Mustard Oil.—Out of the 26 samples examined, 17 were found adulterated, the adulterant being mainly groundnut oil.

Rice.—Of the 89 samples examined, 49 samples were found to be below 0·37 per cent in phosphoric anhydride contents. The samples have been grouped according to their phosphoric anhydride contents as follows :—

Phosphoric anhydride content.	Number of samples.	Percentage.
Below 0·30 per cent ...	17	19·1
From 0·30 per cent to 0·36 per cent.	32	36·0
0·37 per cent and above	40	44·9

III. Investigation and Research.—(a) *Eijkman Test.*—It is held by many that lactose fermenters of fæcal origin have a heat tolerant property and they produce acid and gas at 46°C while lactose fermenters of non-fæcal origin would fail to produce acid and gas in such condition. To find out whether this observation holds good in the case of Burma waters, 347 samples of water collected from various sources were tested in this laboratory during the year under report. Fifty c.c. of test water was added to 50 c.c. of double strength MacConkey broth in a test tube. The tube was incubated for 48 hours in a water-bath kept at a constant temperature of 46°C, after which it was examined for the presence of acid and gas. Of the 140 samples of water showing a satisfactory standard of purity (presumptive coli test at 37°C showing 100 c.c. — or +), none produced acid and gas when incubated at 46°C. From the 121 samples, true coliform organisms were isolated at 37°C whereas only 88 of these samples showed acid and gas at 46°C. In other words, heat-tolerant test failed to detect 28 per cent of bad water. Only citrate +, Indol — lactose fermenters were isolated from MacConkey broth culture in case of 86 samples incubated at 37°C. Out of these, 12 samples produced acid and gas in the same media incubated at 46°C. Every one of these 12 tubes was plated and from five of them, citrate —, Indol + organisms were isolated, whereas seven showed citrate + Indol — organisms only. These tests show that incubation at 46°C does not help in differentiating fæcal from non-fæcal organism ; neither it has any advantage over the presumptive coli test carried out at 37°C. According to Colonel Taylor, however, this heat-tolerant test may be usefully employed in detecting recency of

pollution. According to him, the presumptive test will be positive in equal small quantities of water both at 37°C and 46°C in case of a recent pollution. It is intended to carry out further investigations in the light of Colonel Taylor's observations.

(b) *Detection of argemone oil in mustard oil.*—Recent observations suggest that the poisonous substance in the mustard oil causing the symptoms of epidemic dropsy is derived from the seeds of *Argemone mexicana*, which grow wildly and get mixed with the mustard seeds in varying proportions at the time of harvesting. An attempt was made to detect the presence of this adulterant in samples of oil obtained from various sources. In all, twenty samples were examined. Both the nitric acid test and cupric acetate test were carried out in every case. Of these samples, six showed positive reaction, two of which (one brought by the Port Health Officer, Rangoon, and another by the Assistant Director of Public Health) were traced to persons suffering from epidemic dropsy. The other positive cases were all obtained from local shops and enquiries could not be made as to whether there was any case of epidemic dropsy among the consumers, for want of facilities. The then Director of the All-India Institute of Hygiene and Public Health, very kindly sent to this Institute, specimens of *Argemone mexicana* seed and oil. There is a good deal of outward resemblance between mustard oil and argemone oil, and the possibility that this oil may deliberately be used as an adulterant should always be remembered.

(c) *Glycerine.*—An experiment to investigate the bactericidal properties of glycerine on organisms, *e.g.*, staphylococci, B. coli and aerobic spore-bearers, was conducted during the year both at incubator and frigidaire temperatures. The results obtained are given below :—

Test organisms.	1 in 2 dilution at 37°C.	1 in 2 dilution at frigidaire temperature.
Staphylococci ...	No growth on sub-culture after 2nd day.	No growth on sub-culture after 6th day.
B. coli	Do.	Found alive on the 16th day.
Spore-bearers ...	Found alive on the 16th day.	Do.

Sub-cultures were not made after the 16th day.

(d) *Sea-weed.*—In connection with a scheme proposed for the prevention of goitre, in endemic areas, by administering cleaned and dried sea-weeds, three different samples were purchased locally and examined for their iodine contents. They were found to contain 0·09 to 0·10 per cent of iodine.

(e) *Water filters.*—It was noticed on several instances that tube well waters filtered through "Delphin", "Doulton" or similar common filters, showed on chemical analysis a marked increase in total solid

figures instead of a decrease, as was expected. An experiment with new, as well as used filters of various types showed that a prolonged use of a filter rendered insoluble carbonates of lime and magnesia deposited in the pores, with the result that when waters containing free carbon dioxide were passed through them, the hitherto insoluble carbonates became soluble and filtered through the pores, thereby causing an increase in the total solids over that of the unfiltered sample.

(f) *Nutritional.*—The most important investigation carried out during the year was on nutrition. A total of 170 samples of food comprising of cereals, dried fish, *ngapi*, beans, vegetables, sweets, and other articles of diet were examined for moisture, proteins, fat, carbohydrates, mineral matter, calcium, phosphorus, iron, and calorific value. Estimation of vitamin C contents was also done in cases of fruits and vegetables. A table showing the vitamin C contents of various vegetables and fruits thus examined, is appended to this report. Details of the other tests will be reported in due course.

IV. PUBLIC HEALTH PROPAGANDA.—Various articles of exhibit belonging to the Red Cross Society and maintained at this Institute were sent out on nine occasions during the year under report to the following places :—

(1) Pegu Pagoda Festival.
(2) Gamu Village (Insein District).
(3) Methodist English Girls' High School, Rangoon.
(4) Civil Hospitals in the Hanthawaddy District.
(5) American Baptist Mission Agricultural School, Pyinmana.
(6) Publicity Tour of the riverine towns and villages from Mandalay to Prome.
(7) Medical Science Exhibition Medical College, Rangoon.
(8) Rural Reconstruction Vacation School, Meiktila
(9) Health Exhibition and Baby Show, Dedaye.

Lectures on " Malaria " and " Venereal Diseases " were given to the Anglo-Vernacular teachers at the Physical Training Camp at Cabin Island, Kokine, on the 22nd and 29th April 1939.

Lectures and demonstrations on " Malaria " were also given by the Malariologist of the Institute during the Publicity Tour arranged by the Registrar of Co-operative Societies at the following towns and villages on the Irrawaddy River between Mandalay and Prome :—

(1) Ngazun.
(2) Myinmu.
(3) Pakôkku.
(4) Nyaung-U.
(5) Sinbyugyun.
(6) Chauk.
(7) Yenangyaung.
(8) Magwe.
(9) Minbu.
(10) Thayetmyo.

The Annual Health Week Exhibition was not held during the year.

K. P. KUNDU,
M.B. (Cal.), D. Bact. (Lond.),
Director, Harcourt Butler Institute of Public Health.

RANGOON, *the 27th May 1940.*

TABLE I.

Detailed statement of various articles (other than water) examined during the year ending 31st December 1939.

No.	Description of samples.	Number examined.	Number adulterated or otherwise unsatisfactory.	Percentage.
(1)	(2)	(3)	(4)	(5)
1	Argemone oil	1	...	...
2	Atta	1	...	...
3	Bleaching Powder	2	...	...
4	Boiler Tube incrustation ...	1	...	...
5	Broth	12	...	...
6	Butter	5	2	40·0
7	Cholera vaccine for percentage of phenol.	6	...	..
8	Cinchona Febrifuge tablets ...	19	...	...
9	Coffee	3	..	...
10	Curd	2	...	...
11	Dhall	3	1	33·3
12	Eye-Lotion tablets	3	...	...
13	Flour, wheat	3	1	33·3
14	Filter scrapings	3	...	...
15	Ghee	108	10	9·3
16	Lozenges	1	...	...
17	Milk, condensed	21	3	14·3
18	Milk, fresh	72	61	84·7
19	Milk, dried	3	2	66·7
20	Mustard oil	26	17	65·4
21	Rice for Phosphoric anhydride ...	89	49	55·1
22	Rice bran	25	...	...
23	Rice for food values	110	...	...
24	Bamboo seeds for food values ...	2	...	...
25	Bamboo rice for food values ...	3	...	...
26	Kywe-U for food values ...	1	...	...
27	Roasted beans for food values ...	1	...	...
28	Sweets for food values ...	3	...	...
29	Spices for food values ...	1	...	...
30	Soya beans for food values ...	3	...	...
31	Vegetables and other food stuffs for food values.	74	...	...
32	Sea-weeds	3	...	...
33	Sugar	1	...	...
34	Miscellaneous	7	...	...
	Total ...	618		

TABLE II.

Vitamin C contents of some important fruits and vegetables.

No. (1)	Name. (2)	Vitamin C contents (in mgs. per 100 gms.) (3)	Portions examined. (4)
1	Jin-kha-baung-thee	237·5	Whole fruit.
2	Sweet Lime	60·50—90·80	Juice.
3	Guava (semi ripe)	68·60	Pulp.
4	Guava (ripe)	61·40	Do.
5	Guava (green)	38·30	Do.
6	Lemon	40·2—52·8	Juice.
7	Orange	28·08—50·1	Do.
8	Tomato (ripe)	43·90	Do.
9	Tomato (green)	24·0—41·2	Do.
10	Tomato (semi-ripe)	39·71	Do.
11	Lime (ripe)	14·65	Do.
12	Lime (green)	10·85	Do.
13	"Ju" vegetables	11·0	Edible portions.
14	Kyaung-sha-thee	3·0	Do.
15	Pe-zaung-jan	1·0	Do.

G.B.C.P.O.—No. 233, D.P.H., 23-4-31—25—VIII.